United States Department of the Interior

FISH AND WILDLIFE SERVICE

September 8, 2003

Jennifer Walker
Regulatory Branch
CESWF-PER-R
U.S. Army Corps of Engineers
P.O. Box 17300
Fort Worth, Texas 76102-0300

Consultation # 2-15-F-2003-0239

Dear Ms. Walker:

This document transmits the U.S. Fish and Wildlife Service's (Service) Biological Opinion (Opinion) based on our review of the proposed Smiling Mallard Development, Ltd.'s Indian Lakes Development (PN 200200385), located in Brazos County, Texas and its effects on the federally listed endangered Navasota ladies'-tresses *(Spiranthes parksii)* in accordance with section 7 of the Endangered Species Act of 1973, as amended (Act) (16 U.S.C. 1531 *et seq.*). Your March 20, 2003, request for formal consultation was received on March 24, 2003.

This Opinion is based on information provided in the January 21, 2003, section 401/404 Joint Application, the June 2003 draft mitigation plan, the Supplemental Mitigation Plan submitted in August 2003, and the Corps response to a draft biological opinion transmitted to the Corps on June 20, 2003. This Opinion is also based on meetings, correspondence, emails, and telephone conversations between individuals from Smiling Mallard Development, Ltd., HDR Inc. (HDR), the Corps of Engineers (Corps), and the Service. A complete administrative record of this consultation is on file at this office.

Consultation History

On February 7, 2001, Service biologists Mary Orms and Dianne Lee conducted a site visit with Chuck Ellison (attorney), Paul Clarke (Clarke and Wyndham Properties), Jeff McDowell (ReMax Realty), Dr. Fred Smeins (Texas A&M University), and another unidentified individual at the proposed project site. Fred Smeins described his survey work for the parcel. Dianne Lee explained that 2000 was not a good year to survey for Navasota ladies'-tresses and that we would expect additional plants in more favorable years. Ms. Lee also expressed a concern that potential habitat in the center of the property had not been delineated.

On February 5, 2001, the Service received a copy of an endangered species/wetland survey for the property. On February 8, 2001, Dianne Lee sent a copy of notes that Service botanist Kathryn Kennedy had made regarding habitat parameters of Navasota ladies'-tresses to Dr. Fred Smeins.

On March 9, 2001, the Service received a copy of a proposal to minimize impacts to Navasota ladies'-tresses on site. On May 24, 2001, the Service provided a letter to Paul Clark stating that the one year species survey

and techniques to estimate potential habitat appeared adequate for the site and situation. We also concurred that the proposed conservation area would minimize impacts to the Navasota ladies'-tresses on site.

On September 10, 2002, the Service attended a site visit regarding a revised proposal for the project area. The new proposal eliminated three of six planned impoundments.

On February 4, 2003, the Service received a copy of a joint section 401/404 permit application for an individual permit and water quality certification to authorize impacts to wetlands and other waters of the U.S. as a result of the proposed project. The Corps initiated section 7 consultation on the proposed project with a March 20, 2003, letter to the Service. The Service acknowledged this initiation in an April 23, 2003, letter.

On June 9, 2003, the Service received the final mitigation plan and HDR's response to agency comments on the initial section 401/404 Joint Application.

The Service provided a draft biological opinion to the Corps on June 20, 2003. On July 23, 2003, the Corps informed the Service that the details of the project may change and requested that the Service delay finalizing this Opinion until several issues with regard to avoidance and mitigation for impacts to waters of the U.S. were addressed.

On September 2, 2003, HDR provided the Service with comments on the draft Opinion reflecting changes to the proposed project description. On September 3, 2003, the Service received the August 2003 Supplemental Mitigation Plan amending the June 2003 Mitigation Plan.

BIOLOGICAL OPINION

Description of the Proposed Action

Smiling Mallard Development, Ltd. is proposing to develop a 1,500-acre site into a single family residential area. The proposed project site is located at the southern end of Arrington Road, southeast of State Highway 6, College Station, Brazos County, Texas. The property consists of two parcels, the Indian Lakes tract and the former gun club tract (see Figure 1).

The currently proposed project would result in the development of over 120 residential lots, ranging in size from 1.2 acres to 13 acres, on the western side of the Indian Lakes tract. In addition, a 48-acre (surface area) on-channel impoundment on one intermittent tributary to Peach Creek, several off-channel ponds, stream buffer corridors, erosion control/sediment detention ponds, riding/hiking trails, environmental education areas, and associated infrastructure are also planned.

Infrastructure within the first several phases of the project will consist of fifteen, 24-foot to 30-foot wide, paved streets, 6-inch and 10-inch water lines, and overhead electric lines located in public utility easements adjoining the road right-of-ways (ROW). Total road/utility ROW widths will vary between 100 to 110 feet depending on projected traffic volumes and design criteria. These alignments may be modified slightly as the project progresses through to the final design. Future phases within the larger development will contain additional streets and improvements in uplands. However, no other impacts to waters of the U.S. beyond those described herein are anticipated.

To facilitate construction of the proposed development, the applicant has applied to the Corps for authorization to impact approximately 11,615 linear feet (1.28 acres) of jurisdictional waters of the U.S., including 8,745 linear feet (1.0 acre) of intermittent and 2,870 linear feet (0.28 acre) of ephemeral stream channels. Of this total, 9,578 linear feet (1.05 acres) would be either flooded by the proposed 48-acre on-channel impoundment or filled due to construction of the dam. Approximately 2,037 linear feet (0.23 acres) of 11 stream channels would be impacted by road crossings and utilities.

In order to avoid impacts to waters of the U.S., the applicant has eliminated five impoundments from the original design, thus reducing impacts to intermittent and ephemeral stream channels by 16,496 feet. The applicant has also avoided road crossings wherever possible and designed them perpendicular to streams where practicable. The project design includes protection of disturbed areas using appropriate erosion and sedimentation control measures. In addition, energy dissipation and erosion and sedimentation controls will be implemented to minimize scour erosion and sedimentation downstream of the proposed impoundment. Finally, a stormwater management system will also be constructed to minimize water quality impacts to downstream receiving waters.

Mitigation for on-site impacts to waters of the U.S. will include restoration/creation of approximately 3,135 linear feet of three intermittent and 5,973 linear feet of nine ephemeral streams on the Indian Lakes and the former gun club tracts. These activities are also expected to enhance the functions of an additional 500 feet of intermittent and 1,222 feet of ephemeral streams downstream of the restored areas. Restoration/creation activities will include removing on-channel ponds, restoring historic stream hydrology, recontouring slopes, revegetating banks, installing grade erosion control measures such as natural rock segments in the stream, and creating pilot channels where silt has been deposited.

The applicant will also construct six detention basins in uplands to help control on-site erosion created by past land use activities. The ponds will either be created using low dams with erosion protected spillways constructed in eroded areas or they will be created through excavation and grading activities. Native grasses and trees will be planted around each pond to enhance riparian habitat.

In addition to creation and restoration of stream channels, the applicant proposes to establish 150-foot (75 feet from each side of the stream channel) conservation buffers on 6,587 linear feet of intermittent and 11,260 linear feet of ephemeral stream channels. In addition, approximately 19,199 linear feet of intermittent and 2,236 linear feet of ephemeral stream channels would be protected by a 300-foot wide (150 feet on either side of the stream channel) conservation buffer. The applicant also proposes to deed restrict and maintain a 60-foot wide vegetated buffer with a minimum of 60 percent intact native vegetation around the proposed Lake Arapaho shoreline and a 150- by 515-foot (3.18 acres) upland

wildlife corridor that would connect two buffered stream corridors in the central portion of the Indian Lakes tract. The conservation buffers will be deed restricted and filed with Brazos County. For properties that border conservation buffers, a residential covenant to restrict mechanized vegetation clearing in the buffer areas will be established. Vegetation clearing will be limited to selective clearing or treatment of invasive, noxious, or exotic plant species with the approval of the developer. The conservation buffers will allow for a meandering 4-foot wide mulch or crushed rock hiking/walking trail.

The applicant also proposes to create a 32-acre Navasota ladies'-tresses preservation area in the northeast portion of the Indian Lakes tract. It will be established along and adjacent to the streams and gullies where the largest number of Navasota ladies'-tresses plants were documented (43 plants). The Navasota ladies'-tresses preservation area would encompass an irregularly shaped polygon approximately 600 feet by 2,300 feet with three arms extending westward 300 to 600 feet from the main polygon (see Figure 2). Over 5,000
linear feet of stream and approximately six acres of occupied Navasota ladies'-tresses habitat will be encompassed within this area. A conservation easement will be placed on the Navasota ladies'-tresses preservation area to protect it in perpetuity and no lots will be platted within the easement boundaries. This is a voluntary action taken to provide benefits to the species.

In order to protect the current population of Navasota ladies'-tresses plants in the preservation area, a management plan will be created to maintain and enhance, where possible, conditions to support the Navasota ladies'-tresses. The main concerns to be addressed include maintenance of the current hydrologic regime and vegetative cover.

To prevent alteration of the stream flows, that could result in loss of stream bank soils and vegetation, the applicant plans to closely monitor upstream activities. In addition, the Navasota ladies'-tresses preservation area was configured to provide sufficient vegetated buffer areas to protect against increased overland flow and accelerated erosion. Use within the Navasota ladies'-tresses preservation area will be restricted and the only development will be a walking trail that will cross the area. Careful placement of walking trails, the use of signs, and selective placement of fencing will all be used to prevent trampling of any Navasota ladies'-tresses plants within the preservation area and to direct foot traffic away from unstable streambanks.

To maintain the current vegetative structure within the preservation area, permanent transects will be established across the conservation area and the current vegetation structure and composition will be assessed. When potentially negative changes are detected (for example, substantial increases in woody or herbaceous cover), remedial actions such as woody plant thinning or mowing of herbaceous cover will be taken to reverse these trends.

Finally, within stream buffers where soils, topography, and hydrology appear favorable for Navasota ladies'-tresses, the applicant proposes selective thinning of woody vegetation to provide additional habitat for the species. Mechanical, herbicidal, and prescribed burn treatments, where feasible, would be utilized to control woody species in small experimental areas. Care would be taken to minimize surface soil disturbance and protect the integrity of the hydrology of the site.

Species Description and Status

Navasota ladies'-tresses

Description

The Navasota ladies'-tresses, a woodland orchid known from 11 counties in central Texas, was federally listed as endangered on May 6, l982 (47 **FR** 19539), without critical habitat. This orchid is an erect, slender-stemmed perennial that grows 8-15 inches tall. The linear leaves form a rosette, but are absent at the time of flowering. White flowers are arranged spirally on the stalk and have conspicuously white-tipped bracts that appear beneath each flower. Flowers are about one-quarter-of-an-inch long with rounded petals. Side petals have a distinct green stripe and extend past the central petals. The lower central petal is ragged. Buds appear in early to late October, and flowering occurs from mid-October to mid-November.

Life History

Navasota ladies'-tresses occur in a variety of moist sandy soils near drainages, typically from the upper erodible drainage head, extending along the edges of temporary streams to the floodplain of permanent streams. Typical habitat consists of natural openings in upland Post Oak Savannah vegetation (Poole and Riskind l987, Service 1984). Plants are believed to be situated where subsurface flow or seepage of water occurs seasonally, a common feature in other species of the genus (Arft and Ranker 1995, Kathy Parker, Tejas Environmental Services, pers. comm.). It is known that the occurrence of claypans beneath the sandy or loamy soils in this area makes these subsurface areas resistant to water percolation, and hence, water tends to travel along these subsurface features toward the dissected drainages typical of the area, providing a relatively dependable moisture source for the orchids. While the Navasota ladies'-tresses occurs in small naturally-created openings in the post oak woodlands, it cannot be regarded as a disturbance species, as it usually occurs in well-developed woodlands and does not colonize extensively disturbed areas. It is rarely found in floodplain forests and open areas dominated by grasses (Wilson 1993).

Navasota ladies'-tresses are extremely slow-growing and long-lived, and individual plants depend on a symbiotic relationship with soil fungi that is established before the seed germinates. The seeds are very small and lack any endosperm, so they are very short-lived and the species does not maintain any appreciable soil seed bank. Rosette leaves support the formation of storage tubers between November and March that sequester resources in preparation for sending up a leafless bloom stalk at some future time. It is believed that plants often require more than one year of photosynthate storage to successfully send up a bloom stalk. If local conditions have not been favorable for forming sufficient below-ground reserves, the plant may not bloom (Wilson l993).

Vegetatively, Navasota ladies'-tresses plants are very hard to discern in their habitat, and therefore, surveys are not recommended except during the blooming season. In addition, this species is very similar to two other species that can occur in the same area. Positive identification can only be made during flowering, and blooming is strongly dependent on adequate moisture the previous April/May and

again in August/September (Wilson 1993, Service l984).

Population Dynamics

Pavlik (1996) proposed a method for estimating minimum population sizes needed for viable plant populations by evaluating nine important biological characteristics of the species of interest. Evaluating Navasota ladies'-tresses using this system, the biological characteristics would rank as needing moderate to high population sizes for three of the factors considered, moderate population sizes for three other factors, and low population sizes based on only two of the characters. Ranking the factors on a six point scale from low population size (50) to high population size (2,500), the Service has estimated viable populations for this species may be in the range of 500-800 mature individuals. However, few known population areas approach this number of individuals even when factoring in the plants that are likely present but not blooming. Because of the low numbers of reported individuals, the slow growing nature of the plants, their unusual habitat requirements, and their sensitivity to disturbance and transplanting attempts, the species is not regarded as being very resilient, and, following any disturbance to a population, recovery is expected to be very slow.

Status and Distribution

Navasota ladies'-tresses occur in Brazos, Burleson, Freestone, Fayette, Grimes, Jasper, Leon, Madison, Milam, Robertson, and Washington counties (Texas Biological Conservation Data System [TXBCD] 2001). Currently, approximately 137 sites have been recorded, representing probably 75-80 distinct population areas predominantly concentrated around southern Brazos County and central Grimes County. Over 20 percent of the 137 recorded sites, however, are known to have been damaged or destroyed since they were first reported. In fact, over 77 percent (106) of the recorded observations of Navasota ladies'-tresses are either over 10 years old, represent extirpated populations, or are lacking adequate survey information. In addition, in the majority of population areas, fewer than 25 plants were recorded, although not all individuals in a population are necessarily visible above ground in a given year and many of these sites have been visited only once (TXBCD 2001).

The primary threat to Navasota ladies'-tresses is destruction or modification of habitat from urbanization, clearing for agricultural production, or mining (47 **FR** 19539, Service 1984). Destruction of understory by feral pigs is also a problem in some areas. Post oak savannah in many of these counties continues to be converted to bermuda grass pasture. Subsequently, habitat loss continues, particularly in the areas of Brazos and Grimes counties where most sites are located. Mining in Grimes County disturbs more than 7,000 acres every five years (Wilson l993). In addition, the City of College Station in Brazos County is growing rapidly, particularly in the southern and southeastern fringes where most known Navasota ladies'-tresses populations occur.

Navasota ladies'-tresses apparently do not transplant well. In a mining project in Grimes county by Texas Municipal Power Association (TMPA), plants in the impact area were removed and transplanted into an adjacent habitat area. Plant survival has been low at most sites (TMPA l996). Similarly, in an experiment in Lick Creek Park near College Station, Dr. Hugh Wilson planted some seedlings which

survived into their second season, but died prior to the third growing season (Wilson l993).

In order to recover the Navasota ladies'-tresses, the Service's goals are to establish and maintain two safe sites through cooperative agreements, purchases, easements, or other means of obtaining management rights. Other needs of the species include the development of a baseline set of ecological data from sites where the species currently exists, and development of public awareness, appreciation, and support for protection and recovery of the Navasota ladies'-tresses (Service 1984).

The following summarizes the occurrence information for the eleven counties in which Navasota ladies'-tresses occurs (all information is from the TXBCD 2001 unless otherwise noted):

Brazos and Grimes counties: Of the 137 total known Navasota ladies'-tresses occurrences, 85 percent were recorded from locations in either Brazos or Grimes counties. Twenty-eight have been reported from Brazos County alone and occur mostly in the southern and central portions of the county. Seven of the twenty-eight recorded observations, however, occur in the northeast corner of the county.

Of the reported occurrences of Navasota ladies'-tresses in Brazos County, three records provide only the years Navasota ladies'-tresses were observed (1946, 1982, and 1982) and another record merely reports that Navasota ladies'-tresses were documented in 1986. A survey from 1987 reported an occurrence of a large population scattered over the surveyed area and six additional records report occurrences of 6, 16, 38, 45, 76, and 112 plants from surveys conducted in 1993. In 1995, a survey reported an occurrence of 56 plants. In 2000, the most recently documented occurrence of Navasota ladies'-tresses in Brazos County, 48 plants in three subpopulations were found. An additional occurrence record documents three subpopulations bisected by State Highway (SH) 6 containing 26, 150, and 1,000 plants. The 1,000 plants were documented on an eight acre site permanently protected by the Texas Department of Transportation (TxDOT) as a result of a section 7 consultation on a SH 6 widening project south of College Station. However, no recent survey information is available for this site.

Eighty-eight occurrences of Navasota ladies'-tresses have been reported from Grimes County. Of these eighty-eight, seventy-eight occur on the Texas Municipal Power Authority's (TMPA) Gibbons Creek Station lignite mine. Of the ten sites not recorded on the mine site, three occur at Alum Creek, just northwest of the mine, and one occurs in the northwest corner of the county at Democrat Crossing. The Alum Creek sites had 3, 3, and 9 plants, respectively, in a 1984 survey and the Democrat Crossing site had 5 plants in a 1983 survey. The six other sites not at the mine occur mostly within close proximity of the TMPA property. Four were surveyed in 1983 and plant numbers were recorded as 3, 4, 6, and 7. The two other sites were surveyed in 1986 and 1989 with plant numbers recorded as "a few plants," and one plant, respectively.

As a result of earlier mining activities, twenty-eight of the known occurrences on the mine site were extirpated. Those plants that were not destroyed by the mining were transplanted and TMPA agreed, through earlier section 7 consultations on mining activities, to protect five sites for the life of the mine. These sites encompass about 175 acres and the numbers of Navasota ladies'-tresses on the five sites range from a high of 955 plants in 1995 to a low of 36 plants in 1996. Surveys in 2000 found 17 plants with one site not surveyed while surveys in 2002 found 101 plants across the fives sites. These numbers include both transplanted plants and those originally found on these sites. The majority of the remaining

extant sites in the TMPA area were each surveyed at least one year between 1984 and 1994 with plant numbers ranging from 1 to 83 on these sites. Several sites were surveyed two or more years but plant numbers did not vary significantly.

Burleson County: Two occurrences of Navasota ladies'-tresses have been recorded. One occurrence was reported to have 80 plants in 1983 and 25 in 1986. The other record represents a population of 73 plants that were transplanted to the area in 1986. While eight plants were observed at this site in 1987, none were found in 1988, 1991, or 1997 surveys.

Fayette County: The only known location of Navasota ladies'-tresses was documented in a 1994 transmission line survey and has not been documented since. One flowering Navasota ladies'-tresses and three flowers that were intermediate between *Spirathes parksii* and *S. cernua* were present.

Freestone County: Navasota ladies'-tresses found in this county represent the northernmost extent of the known range for this species. TXBCD documents one occurrence of 28 plants that was observed in Freestone County in 1991. Survey data from the Jewett Mine indicates that three subpopulations of Navasota ladies'-tresses were found within the mine. However, all remaining populations in Freestone County not extirpated during the earlier mining activities will be extirpated as a result of the proposed mining operations in the Permit 47 Area of the Jewett Mine (consultation # 2-15-02-F-0214).

Leon County: One occurrence of 13 Navasota ladies'-tresses was reported in 1987. An additional record was reported in 1986, although this occurrence is questionable.

Jasper County: Two occurrences of Navasota ladies'-tresses have been recorded. One of these records represents two plants observed in 1996, while the other represents one flowering plant and six sterile plants observed in 1997.

Madison County: Two records have been reported from this county. One of these occurrences was reported in 1987, but survey data is lacking for both of these sightings.

Milam County: Only one record of Navasota ladies'-tresses exists. There were three plants observed there in 1993 but there are no records of subsequent surveys for Navasota ladies'-tresses in this county.

Robertson County: Seven occurrences of Navasota ladies'-tresses have been reported, however, survey data was not available for three of these records. Of the other four records, one occurrence was reported as three plants found in a 1983 survey and the others were recorded in 1997 surveys as 3 plants, one plant, and two subpopulations containing a total of 11 plants.

Washington County: Two sightings of Navasota ladies'-tresses have been recorded, however, one of these records has no survey data associated with it, and the other represents a population of 19 plants that were transplanted to the area in 1986. Two plants were observed at the transplant site in 1988 and none were found in surveys conducted in 1991 and 1999.

Analysis of the Species to be Affected

The proposed project area encompasses one of 21 known occurrences of Navasota ladies'-tresses in central Brazos County. Another three occurrences of Navasota ladies'-tresses are located adjacent to the western main parcel boundary, just off the southeast corner of the Indian Lakes tract, and just off the northeastern corner of the former gun club tract.

Environmental Baseline

Status of the Species Within the Action Area

The Service considers the action area to be the 1,500 acre development site. According to Dr. Smeins' survey, Navasota ladies'-tresses on this site were all found within 20 feet of the gully margins and none were found below the 250 foot contour. In the areas below the 250 elevation, Dr. Smeins indicates that the stream floodplains become wider, the areas are more frequently flooded, and the stream margins are not as abrupt and do not have the soil texture and profile or drainage regime that favors the species. In addition, most areas in the bottomland forest and stream margins below 250 feet have well developed canopies nearing 100 percent cover in both the tree and shrub layer thus eliminating the openings needed by the Navasota ladies'-tresses.

Using a 30 foot buffer on either side of stream margins above the 250 foot contour, it was estimated that approximately 31 acres of habitat potentially occurs on the Indian Lakes tract (Figure 2). Of this, approximately seven acres were determined to actually support populations of Navasota ladies'-tresses and approximately 40 percent (10 acres) of the remaining 24 acres was determined to have a high potential habitat suitability based upon vegetative cover, soils, topography, and drainage regime. The remaining 14
acres were determined to have a moderate to low potential to support the Navasota ladies'-tresses in the

current vegetative condition. Most of these areas have a dense overstory and understory of trees and shrubs which reduces light levels and preclude the presence, or if present, the growth and flowering of the Navasota ladies'-tresses.

At least 48 Navasota ladies'-tresses individuals were confirmed on-site during surveys in 2000. Most (43) occurred along the main eastern drainage of the property and connecting gullies. Two occurred near the southern project boundary and the other three were located in the southwestern corner of the property (Figure 2). Nearly all individuals were located on the immediate high bank edges of streams or gullies. Most were precariously growing on sloughing-off portions of the bank. The three areas with Navasota ladies'-tresses present were also surveyed in 2001 and 2002 and in the site with 43 individuals, only 22 were found in 2001 and 9 in 2002. The other two locations where 2 and 3 individuals were present in 2000 had no plants present in 2001 or 2002.

Finally, three other populations of Navasota ladies'-tresses with 100, 26, and 1 plants, documented during a 1983 survey, occur near or adjacent to the proposed project boundaries on the southwest, northeast, and southeast corners respectively. The actual locations of the plants within the documented survey areas, however, is unknown. In addition, the status of these populations is unknown as none of these areas has been surveyed since 1983.

Factors Affecting Species Environment Within the Action Area

HABITAT AND SOILS

The 1,500 acre project site consists mainly of wooded rangeland dominated by native and introduced grasses with areas of dense tree coverage. Wooded areas are primarily dominated by post oak (*Quercus stellata*) and yaupon (*Ilex vomitoria*). Eleven intermittent (33,982 linear feet) and 31 ephemeral (26,638 linear feet) stream channels, tributaries to Peach Creek in the Navasota River watershed, occur within the project area. Upland soils on the property are predominantly comprised of Burlewash fine sandy loams (0 to 8 percent slopes) with small inclusions of Shiro loamy fine sands (1 to 3 percent slopes). Frequently flooded Sandow loams and Uhland loams are primarily found in floodplain drainages.

LAND USE

Due to various physical disturbances from previous land use on-site, such as gravel exploration, grazing, road, and pipeline development, extensive erosion and gully formation has occurred on the property, including sheet erosion across the land surface. Land use surrounding the project area is mainly suburban and rural. The suburban area is mostly low density residential areas and the rural area is mainly undeveloped pastureland and dense wooded areas.

The most pressing threats in the vicinity of the proposed project area are rapid urban growth south of College Station. Post oak woodland is considered prime acreage for housing developments, and sales of large tracts of land slated for residential and commercial development are taking place throughout the area. In 1997, Bryan-College Station was ranked the fifth fastest growing American city (Kiplinger's Personal Finance Magazine). Between 1980 and 1999, the population increased by 57 percent (Bryan-College Station Economic Development Board 2001). Presently, most of the urban growth is occurring on the south side of

College Station because of the area's proximity to Texas A&M University and associated economic enterprises. However, as the economy of the Bryan-College Station area grows, land to the north and east of the metro area, and along SH 21/US 190, may also be developed.

PREVIOUS CONSULTATIONS

The following four projects have affected the central Brazos County populations of Navasota ladies'-tresses:

(1) The widening of SH 6 from north of Alum Creek to FM 159 caused the loss of approximately 33 acres of post oak habitat and at least 9 known Navasota ladies'-tresses plants. As compensation for these losses, TxDOT purchased a conservation easement over eight acres of known Navasota ladies'-tresses habitat near the Texas Speedway. Although at one time Navasota ladies'-tresses plants on this site numbered as many as 1,000 individuals (TXBCD 2001), no recent information is available as to the number of Navasota ladies'-tresses present at this time.

(2) Improvements to SH 6 from FM 159 to 4 miles northwest of the City of Navasota caused the loss

of approximately 28.73 acres of post oak habitat. As part of the project, TxDOT will contribute $161,655.21 to the National Fish and Wildlife Foundation to be used to fund habitat preservation/conservation for Navasota ladies'-tresses.

(3) Construction of SH 40 from FM 2154 near S. Graham Rd to SH 6 at Greens Prairie Road resulted in the loss of an estimated 11 Navasota ladies'-tresses plants. An additional 5 known Navasota ladies'-tresses and 40 uncertain rosettes within the ROW for SH 40 were expected to decline due to potential changes in site hydrology and nearby earth disturbance activities. As part of this project, TxDOT purchased a 38-acre conservation easement along a tributary of Spring Creek with the goal of protecting a minimum of 33 plants. A total of 56 plants were known to exist on this site at the time of purchase, however, the current status of the area is unknown at this time. The area containing the 40 identified rosettes was also preserved as a part of the proposed project.

(4) An additional formal section 7 consultation with the Corps of Engineers resulted from potential impacts to the Navasota ladies'-tresses plants identified on the 735-acre Crowley property during the SH 40 surveys. The plants in zone 1, 2, 3, and 7 were the subject of this consultation. Of the 19 plants found in the four zones, the 14 plants found in zones 1, 2, and 7 would be eliminated by the proposed mixed-use master planned development consisting of single and multi-family residential, commercial, institutional, and recreational uses. The 5 plants found in zone three were to be preserved by a greenway located along Spring Creek.

Effects of the Action

Potential negative effects on Navasota ladies'-tresses from residential development in the stream segments where three and two Navasota ladies'-tresses plants were found include: trampling, mowing, clearing, edge effects, competition from residential plantings, changes in surface and subsurface hydrology (for example, increased runoff and decreased infiltration and subsurface flow), herbicide use on residential lots, and loss of pollinators due to changes in plant composition or pesticide use. Additionally, filling of the 48-acre impoundment would submerge Navasota ladies'-tresses and destroy habitat. Although the habitat on the stream segment where two plants were located will not likely be subject to these pressures immediately, it is, however, located within an area planned as a future phase of development, is not within a conservation buffer, and will likely be subject to these effects at a later date.

Most of the stream segments where the 43 plants were found are not within an area immediately subject to development pressure but are within a planned future phase. Due to the conservation easement, however, these plants and their habitat will not likely be subject to the negative effects experienced by the two smaller populations. The plants in the conservation area may experience some negative effects due to the construction and use of the walking trails through the conservation easement area, however, the applicant has devised safeguards to avoid these effects.

Of the 24 acres that may provide suitable habitat for Navasota ladies'-tresses on the stream segments within Indian Lakes tract, approximately two acres will be preserved within the stream buffers proposed for protection of waters of the U.S. The rest will either be negatively effected by residential development activities in currently proposed or future phases, inundated by Lake Arapaho, or modified due to stream restoration activities.

Thus, residential development and stream impoundment activities in the project area are likely to result in the destruction of at least five Navasota ladies'-tresses plants and the loss or degradation of 22 acres of potentially marginal to highly suitable habitat. In addition, the proposed project will continue to add to the gradual sustained loss of post oak woodland in the area and to Navasota ladies'-tresses habitat fragmentation particularly with respect to the habitats occurring adjacent to the project area perimeter.

Beneficial effects of the proposed activities include the preservation, in perpetuity, of the native vegetation and remaining Navasota ladies'-tresses plants and their habitat in the Navasota ladies'-tresses preservation area. Potential beneficial effects may also occur from woody plant control in the streamside buffer habitats that have appropriate soils, topology, and hydrology to support Navasota ladies'-tresses. This would depend on whether plants or viable seeds are present in the understory.

Cumulative Effects

Cumulative effects include the effects of future State, local, or private actions that are reasonably certain to occur in the action area considered in this Opinion. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Habitat destruction as a result of the proposed activity was evaluated. Other more indirect cumulative effects are largely unquantifiable. However, the following examination of activities and trends in the area document an expected overall increase in activities that result in fragmentation, degradation, and loss of significant habitat areas that currently exist in Brazos and Grimes counties.

The primary threat to Navasota ladies'-tresses throughout its range is destruction or modification of habitat from urbanization, clearing for agricultural production, or mining (47 **FR** 19539, Service 1995 and 1984b). Destruction of woodland understory by feral pigs is also a problem in some areas. Almost 30 known sites have been lost in the last ten years to lignite mining and many others fragmented or otherwise impacted by urbanization. Post oak savannah in the counties occupied by the Navasota ladies'-tresses continues to be
converted to Bermuda grass pastures. Subsequently, habitat loss continues, particularly in the areas of Brazos and Grimes counties where most sites are located. Mining in Grimes County disturbs more than 7,000 acres every five years (Wilson 1993).

According to the 1997 U.S. Agriculture Census, agriculture continues to be a vital part of the economy of the Brazos Valley. Approximately 70 percent of the land area is devoted to agriculture. Primary crops include cow/calf production, cotton, poultry, corn, hay, sorghum, and milk (Bryan-College Station Economic Development Corporation (BCSEDC) 2001). Livestock and hay production activities are expected to cause continuation of a current trend to clear post oak woodlands and convert them to Bermuda grass pastures. Droughts in Texas depress cattle markets and herd sizes temporarily, but recovery of these markets with the return of the rains puts increased pressures on range and pasture lands. Conversely, droughts increase the demand for hay statewide and associated increases in prices for hay increase the demand for more high-yielding pastures. Consequently, various climatic driven market

conditions support the conversion of additional woodland to hayfields and/or pastures, as well as the increased use of herbicides and seeding with exotic species. All of these practices aggravate habitat fragmentation and cause detrimental changes in community structure for Navasota ladies'-tresses (Navasota ladies'-tresses monitoring data, Kathryn Kennedy, Service, pers. comm.).

According to the Texas State Data Center, the Bryan-College Station community has experienced about a 57 percent increase in population from 1980 to 2000. According to the BCSEDC (2001), the single-family residential market in the Bryan-College Station area is growing. A total of 701 residential building permits were issued in 1999, and from January to November of 2000, 650 permits were issued. The housing market in Bryan-College Station continues to show the benefits of an expanding economy and continued population growth. In addition, an apartment shortage was not expected for the next 24 months due to a 23 percent increase in the number of multi-family units from 1990 to the end of 1999.

The office building market in Bryan-College Station remains relatively stable in spite of a large over-supply brought about by record-breaking construction of new space during the early 1980s (BCSEDC 2001). The market has remained stable since 1990 in terms of net leasable and occupied area. New office building construction has occurred over the past six years, mostly in southern College Station, bringing the net leasable space to over 1.1 million square feet. In 2000, the Bryan-College Station office market occupancy rate increased by 8.7 percent over the 1999 occupancy rate.

CONCLUSION

After reviewing the current status of the Navasota ladies'-tresses, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the project, as proposed, is not likely to jeopardize the continued existence of the Navasota ladies'-tresses. No critical habitat has been designated for the Navasota ladies'-tresses, therefore, none will be affected.

INCIDENTAL TAKE STATEMENT

Sections 9 of the Act, and Federal regulations pursuant to Section 4(d) of the Act prohibit taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in such conduct) of listed species of fish or wildlife without a special exemption. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Harass is defined as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is any take of listed animal species that results from, but is not the purpose of, carrying out an otherwise lawful activity

conducted by the Federal agency or the applicant. Under the terms of Section 7(b)(4) and Section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered a prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement.

As discussed above, Sections 7(b)(4) and 7(o)(2) of the Act generally do not apply to listed plant species. However, limited protection of listed plants is provided to the extent that the Act prohibits the removal and reduction to possession of Federal listed endangered plants or the malicious damage of such plants on areas under Federal jurisdiction, or the removal, cutting, digging, damage, or destruction of endangered plants on non-Federal areas in violation of any State law or regulation or in the course of any violation of a State criminal trespass law.

Amount or Extent of Take Anticipated

The Service does not anticipate the proposed action will incidentally take any listed animal species.

Effect of the Take

No take of any listed animal species is anticipated as a result of this proposed action.

Conservation Recommendations

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. The Service recommends implementing the following actions:

I. Mark all flowering individuals and determine what percentage of plants flower each year. In addition, document the life span of the plants in the preserve area and note damage to plants or potential negative interactions.

II. In habitats with appropriate soils, topography, and hydrology where woody plant control treatments occur, continue yearly surveys for Navasota ladies'-tresses to determine whether the species responds to such treatment.

In order for the Austin Fish and Wildlife Service Office to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, we request notification of the implementation of any conservation recommendations.

Re-initiation-Closing Statement

This concludes formal consultation on the action outlined in the request. As provided in 50 CFR Sec. 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this Opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this Opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending re-initiation.

If you have any questions regarding this Opinion, please contact Jenny Wilson at (512) 490-0057, extension 231.

Sincerely,

/S/ Robert T. Pine

Robert T. Pine
Supervisor

cc: HDR, Inc. (Attn: James Thomas)

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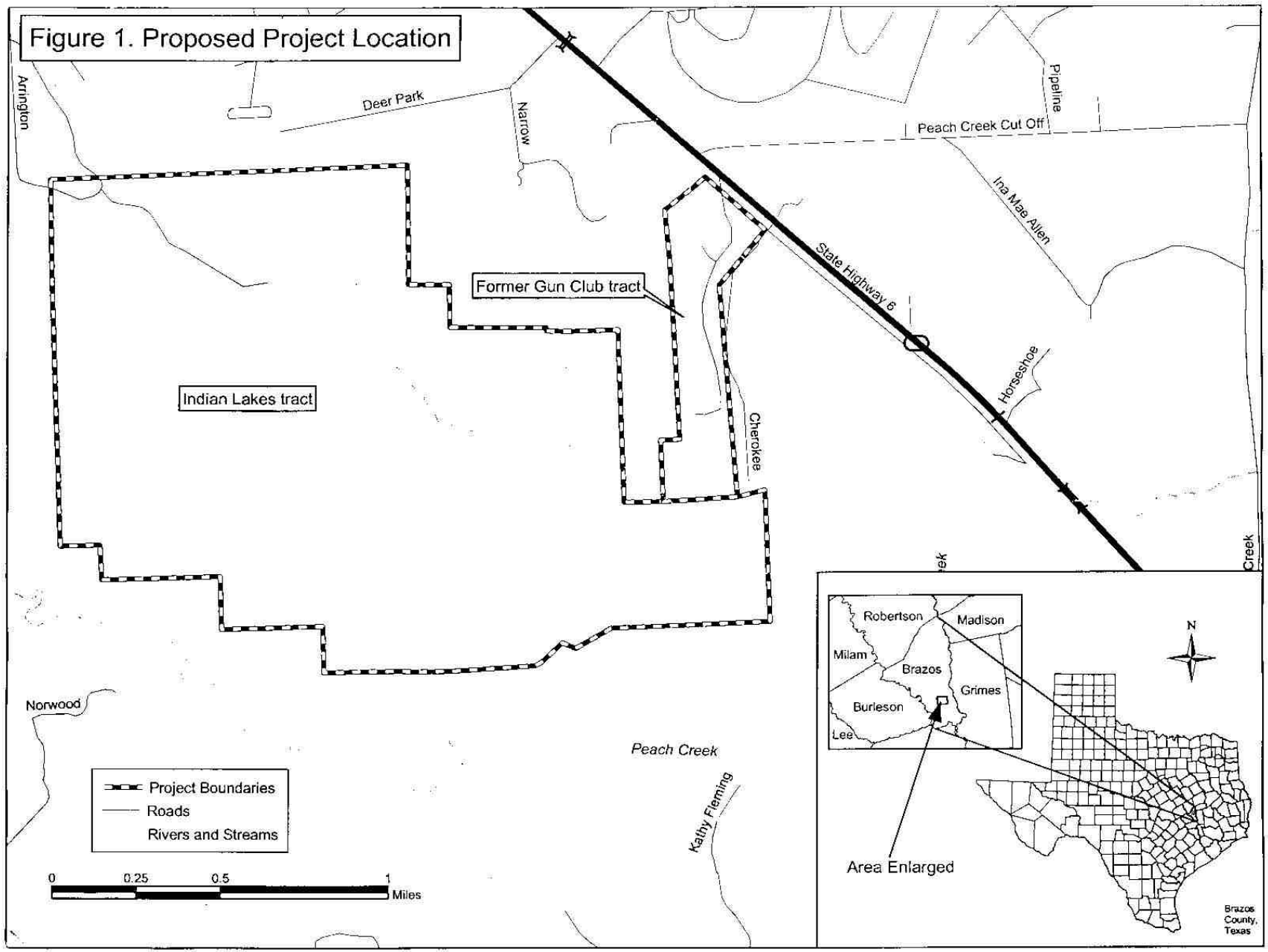
Figure 1. Proposed Project Location
Arrington
Deer Park
Narrow
Pipeline
Peach Creek Cut Off
Ina Mae Allen
State Highway 6
Former Gun Club tract
Indian Lakes tract
Horseshoe
Cherokee
Creek
Norwood
Peach Creek
Kathy Fleming
Project Boundaries
Roads
Rivers and Streams
0
0.25
0.5
1
Miles
Robertson
Madison
Milam
Brazos
Grimes
Burleson
Lee
N
Area Enlarged
Brazos County, Texas

Figure 2. Navasota ladies'-tresses locations, suitable habitat, and preserve area